

DETAILED ACTION

Base on the pre-appeal conference on September 18, 2008, the following action is provided.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-10, 33-34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shim et al (6844717) in view of Hyoungh (2001215257).

Regarding claim 1, Shim et al disclose [see Figs. 1-3] a semiconductor device test apparatus comprising a main body (main body 1) including a sorting robot (combination of tray arrangement stations 80-82) disposed thereon to move along an X-axis, and a loading robot (loading robot 90) and an unloading robot (unloading robot 91 and 92); a soak chamber (soak chamber 50), a test chamber (test heads 100 and 101); a desoak chamber (desoak chamber 60);

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wherein the soak chamber (50), the test chamber (100 and 101), and the desoak chamber (60) are attached to the main body (1). However, they do not disclose that the loading and unloading robot moves in both X-axis and Y-axis. Hyoung discloses [see Fig. 1], main body (mainframe 1) includes a loading robot (loading robot 220) and an unloading robot (unloading robot 710) move along both X-axis and a Y-axis [see paragraph [0045] and [0056] for details]. Further, Hyoung teaches that the addition of biaxial direction of the robots is advantageous because it raises test effectiveness of the device by reducing the time in between chambers which will reduce the test equipment expense. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Shim et al by adding biaxial robots as taught by Hyoung in order to raise test effectiveness of the device by reducing the time in between chambers for the semiconductor device during testing.

Furthermore, neither reference discloses the chambers are separable from the main body (1). It is well known to make elements separable where needed (see MPEP 2144.04; In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961)). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to make the chambers of the prior arts above to be separable since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art.

Regarding claim 2, Shim et al disclose the soak chamber (50), the test chamber (100 and 101), and the desoak chamber (60) are separable from the main body (1) using a sliding unit. However, Shim et al do not disclose the chambers are separable from the main body (1). It is well known to make elements separable where needed (see MPEP 2144.04; In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961)). It would have been obvious to a person

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having ordinary skill in the art at the time the invention was made to make the chambers of the prior arts above to be separable since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art.

Regarding claim 3, Shim et al disclose a semiconductor device test apparatus comprising: a main body (main body 1) including a sorting robot (combination of tray arrangement stations 80-82) disposed thereon to move along an X-axis, and a loading robot (loading robot 90) and an unloading robot (unloading robot 91 and 92); and a stacker (combination of tray supplier 10 and tray deliverer 20) for stacking devices (ICs) before and after a test, the stacker (10 and 20) including user trays (test trays 70) for stacking the devices (ICs), wherein the user trays (70) are interchangeable such that the user trays (70) may be being used to stack the devices (ICs) prior to the test and to stack the devices (ICs) after the test. However, they do not disclose that the loading and unloading robot moves in both X-axis and Y-axis. Hyoung discloses [see Fig. 1], main body (mainframe 1) includes a loading robot (loading robot 220) and an unloading robot (unloading robot 710) move along both X-axis and a Y-axis [see paragraph [0045] and [0056] for details]. Further, Hyoung teaches that the addition of biaxial direction of the robots is advantageous because it raises test effectiveness of the device by reducing the time in between chambers which will reduce the test equipment expense. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Shim et al by adding biaxial robots as taught by Hyoung in order to raise test effectiveness of the device by reducing the time in between chambers for the semiconductor device during testing.

Regarding claim 4, Shim et al disclose the user trays (70) are interchangeable in accordance with the process of the test.

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Regarding claim 5, Shim et al disclose a semiconductor device test apparatus comprising: a main body (main body 1) including a sorting robot (combination of tray arrangement stations 80-82) disposed thereon to move along an X-axis, and a loading robot (loading robot 90) and an unloading robot (unloading robot 91 and 92); a stacker (10 and 20) for stacking devices (ICs) before and after a test, the stacker (10 and 20) including at least one user tray feeder (tray supplier 10) predesignated with a function for stacking un-tested devices (ICs) and at least one user tray sender (tray deliverer 20) predesignated with a function, for stacking tested devices (ICs), wherein the user tray (70) functions being interchangeable during stacker operation. However, they do not disclose that the loading and unloading robot moves in both X-axis and Y-axis. Hyong discloses [see Fig. 1], main body (mainframe 1) includes a loading robot (loading robot 220) and an unloading robot (unloading robot 710) move along both X-axis and a Y-axis [see paragraph [0045] and [0056] for details]. Further, Hyong teaches that the addition of biaxial direction of the robots is advantageous because it raises test effectiveness of the device by reducing the time in between chambers which will reduce the test equipment expense. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Shim et al by adding biaxial robots as taught by Hyong in order to raise test effectiveness of the device by reducing the time in between chambers for the semiconductor device during testing.

Regarding claim 6, Shim et al disclose a semiconductor device test apparatus comprising: a main body (main body 1) including a sorting robot (combination of tray arrangement stations 80-82) disposed thereon to move along an X-axis, and a loading robot (loading robot 90) and an unloading robot (unloading robot 91 and 92); and a stacker (10 and 20) arranged in the main

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body (1), the stacker (10 and 20) having a user tray feeder (10) which loads a plurality of user trays (70) having a desired quantity of devices (ICs) to be tested and a user tray sender (20) which loads the plurality of user trays (70) having the devices sorted by their grades in accordance with the test result, the user tray feeder (10) and the user tray sender (20) interchangeable in their uses in accordance with the process of the test. However, they do not disclose that the loading and unloading robot moves in both X-axis and Y-axis. Hyoung discloses [see Fig. 1], main body (mainframe 1) includes a loading robot (loading robot 220) and an unloading robot (unloading robot 710) move along both X-axis and a Y-axis [see paragraph [0045] and [0056] for details]. Further, Hyoung teaches that the addition of biaxial direction of the robots is advantageous because it raises test effectiveness of the device by reducing the time in between chambers which will reduce the test equipment expense. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Shim et al by adding biaxial robots as taught by Hyoung in order to raise test effectiveness of the device by reducing the time in between chambers for the semiconductor device during testing.

Regarding claim 7, Shim et al disclose a soak chamber (50) for receiving the test tray (70) inputted from the device loader (loader side plate 30), and for preheating or precooling the devices (ICs); a test chamber (100 and 101) for connecting the preheated devices (ICs) in the soak chamber (50) to a socket of a test head (100) and for performing a test; a desoak chamber (60) for receiving the test tray (70) discharged from the test chamber (100 and 101) and for discharging them to a device unloader (unloader side plate 40) after recovering them to a room

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temperature, wherein the soak chamber (50), the test chamber (100 and 101) and the desoak chamber (60) are separable from the main body (1) using a sliding unit.

Furthermore, neither reference discloses the chambers are separable from the main body (1). It is well known to make elements separable where needed (see MPEP 2144.04; In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961)). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to make the chambers of the prior arts above to be separable since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art.

Regarding claim 8, Shim et al disclose the soak chamber (50) and the test chamber (100 and 101) are made of one body to be separated in the same direction. However, Shim et al do not disclose the chambers are separable from the main body (1). It is well known to make elements separable where needed (see MPEP 2144.04; In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961)). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to make the chambers of the prior arts above to be separable since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art.

Regarding claim 9, Shim et al disclose the desoak chamber (60) is separated in same direction as the separation direction of the soak chamber (50) and the test chamber (100 and 101). However, Shim et al do not disclose the chambers are separable from the main body (1). It is well known to make elements separable where needed (see MPEP 2144.04; In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961)). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to make the chambers of the

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prior arts above to be separable since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art.

Regarding claim 10, Shim et al disclose a loading robot (90) for picking up devices (ICs) to be tested, which are in a stand-by status in the user tray feeder (10) and mounting them on a test tray (70) being on a device loading stage (30); a sorting robot (80) for picking up the device discharged to the device unloader (40) and for carrying them to a plurality of sorter tables in accordance with the test result; and an unloading robot (91 and 92) for picking up the device carried to the sorter table and for carrying them to the user tray sender (20).

Regarding claim 33, Shim et al disclose a semiconductor device test apparatus comprising a loading robot (90) for picking up devices (ICs) to be tested, which are in a stand-by status in the user tray feeder (10) and mounting them on a test tray (70) being on a device loading stage (30); a sorting robot (80) to move along a X-axis for picking up the device discharged to the device unloader (40) and for carrying them to a plurality of sorter tables in accordance with the test result; and an unloading robot (91 and 92) for picking up the device carried to the sorter table and for carrying them to the user tray sender (20), and the unloading robot (91 and 92), wherein the operating speed of the loading robot (90), the sorting robot (80) and the unloading robot (91 and 92) is determined based on the speed of testing the device (ICs). However, they do not disclose that the loading and unloading robot moves in both X-axis and Y-axis. Hyoung discloses [see Fig. 1], main body (mainframe 1) includes a loading robot (loading robot 220) and an unloading robot (unloading robot 710) move along both X-axis and a Y-axis [see paragraph [0045] and [0056] for details]. Further, Hyoung teaches that the addition of biaxial direction of the robots is advantageous because it raises test effectiveness of the device by

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reducing the time in between chambers which will reduce the test equipment expense. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Shim et al by adding biaxial robots as taught by Hyoung in order to raise test effectiveness of the device by reducing the time in between chambers for the semiconductor device during testing.

Regarding claim 34, Shim et al disclose a robot including a sorting robot (combination of tray arrangement stations 80-82) disposed thereon to move along an X-axis, and a loading robot (loading robot 90) and an unloading robot (unloading robot 91 and 92) used in a test that receives control signals instructing the robot to carry a device (ICs) at a calculated speed, the calculated speed corresponding based on a time of test execution. However, they do not disclose that the loading and unloading robot moves in both X-axis and Y-axis. Hyoung discloses [see Fig. 1], main body (mainframe 1) includes a loading robot (loading robot 220) and an unloading robot (unloading robot 710) move along both X-axis and a Y-axis [see paragraph [0045] and [0056] for details]. Further, Hyoung teaches that the addition of biaxial direction of the robots is advantageous because it raises test effectiveness of the device by reducing the time in between chambers which will reduce the test equipment expense. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Shim et al by adding biaxial robots as taught by Hyoung in order to raise test effectiveness of the device by reducing the time in between chambers for the semiconductor device during testing.

Regarding claim 37, Shim et al disclose a method for stacking devices (ICs) in a semiconductor test apparatus comprising, predesignating at least one user tray feeder (10) for stacking un-tested devices, predesignating at least one user tray sender (20) for stacking tested

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devices, designating at least one user tray feeder (10) for stacking tested devices based on the test; stacking at least one tested device (ICs) on the at least one user tray feeder (10). However, they do not disclose that the loading and unloading robot moves in both X-axis and Y-axis.

Hyoung discloses [see Fig. 1], main body (mainframe 1) includes a loading robot (loading robot 220) and an unloading robot (unloading robot 710) move along both X-axis and a Y-axis [see paragraph [0045] and [0056] for details]. Further, Hyoung teaches that the addition of biaxial direction of the robots is advantageous because it raises test effectiveness of the device by reducing the time in between chambers which will reduce the test equipment expense. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Shim et al by adding biaxial robots as taught by Hyoung in order to raise test effectiveness of the device by reducing the time in between chambers for the semiconductor device during testing.

Response to Arguments

4. Applicant's arguments filed February 19, 2008 have been fully considered but they are not persuasive.

a) Regarding claim 1, the applicants' state: *"Neither Shim nor Hyoung, whether considered alone or in combination, disclose or suggest all of the features recited in the rejected claims. For example, the combination of references fails to disclose or suggest a semiconductor device test apparatus, comprising a soak chamber, a test chamber, and a de-soak chamber, wherein the soak chamber, the test chamber, and the de-soak chamber are attached to the main body and separable from the main body, as recited in independent claim 1."*

In response to the above arguments, the examiner respectfully disagrees. First, the examiner would like to remind the applicants that a recitation of the intended use of the claimed

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invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

The limitation in question is "...attached to the main body and separable from the main body..." The examiner established using the prior art that chambers are attached to the main body. The word "separable" means capable of being separated. Base on the claimed invention, this is considered as intended use. The examiner believes the prior art still read on the claimed invention.

b) Regarding claim 3, the applicants' argue: *"In rejecting independent claims 3, 5 and 6, it is alleged in the Office Action that Shim discloses all of the features recited therein except for loading and unloading robots that move in both X axis and Y axis directions. However, although the Examiner alleges that Shim discloses the features, no evidence is provided in the Office Action to support the rejection. For example, it is alleged in the Office Action that Shim discloses "a stacker for stacking devices before and after a test, the stacker including user trays for stacking devices, wherein the user trays are interchangeable such that the user trays may be used to stack the devices prior to the test and to stack the devices after the test," as recited in claim 3."*

In response to the above arguments, the prior art disclosed in col. 1, lines 26-31: "As illustrated in FIG. 1 and FIG. 2, the conventional test handler comprises a user tray supplier 10 for loading multiple user trays carrying the testable devices, and a user tray deliverer 20 for loading multiple user trays carrying the classified devices after completing the test, in the front side of a handler main body 1." Further in col. 2, lines 14-17: "...the user tray and the test tray 70 while being operated by a servomotor and a timing belt. By this moving, the devices are transferred from the user tray to the test tray 70 or

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from the test tray 70 to the user tray.” Base on the above, the examiner believes the prior art still read on the claimed invention.

c) Regarding claim 5, the applicants’ argue: *“Regarding independent claim 5, it is alleged, without supporting evidence, that Shim discloses that the user tray functions are interchangeable during a stacking operation. However, the Examiner provides no disclosure of where in Shim such a feature is disclosed.”*

In response to the above arguments, the prior art disclosed in col. 1, lines 26-31: “As illustrated in FIG. 1 and FIG. 2, the conventional test handler comprises a user tray supplier 10 for loading multiple user trays carrying the testable devices, and a user tray deliverer 20 for loading multiple user trays carrying the classified devices after completing the test, in the front side of a handler main body 1.” Further in col. 2, lines 14-23: “...the user tray and the test tray 70 while being operated by a servomotor and a timing belt. By this moving, the devices are transferred from the user tray to the test tray 70 or from the test tray 70 to the user tray. On the other hand, though not shown in the accompanying drawings, a main controller of the test handler includes a conveyor device for circulating the test tray 70 among a loading area, a soaker area, a test area and an unloading area, and a control circuit for controlling drivers of the circulation and those devices.” Base on the above, the examiner believes the prior art still read on the claimed invention.

d) Regarding claim 6, the applicants’ argue: *“Similarly, in rejecting independent claim 6, it is alleged that Shim discloses "a stacker having a user tray feeder which loads a plurality of user trays having a desired quantity of devices to be tested and a user tray sender which loads the plurality of user trays having the devices sorted by their grades in accordance with the test result."”*

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In response to the above arguments, the prior art disclosed in col. 1, lines 22-25: "Such a test handler transfers the 32 or 64 devices to the test head for testing simultaneously, and performs a test in the abnormal temperature surroundings, such as the high or the low temperature." Also in col. 2, lines 46-58 it states: In the second and the third tray arrangement stations 81 and 82, each of the devices is classified according to the test results by the two vertical unloading robots 91 and 92, and transferred to an empty tray placed at the unloading side set plate 40. After the empty tray in the unloading set plate 40 is filled with the devices, the empty tray is transferred and loaded to the user tray deliverer 20 according to the classification by the transfer arm. After that, the transfer arm transfers new empty tray to the unloading side set plate 40, and the above operation is repeated until the inspection for the one lot of the devices is completed.

Base on the above, the examiner believes the prior art still read on the claimed invention.

e) In regards to claim 33, the applicants' state: *"Regarding independent claim 33, it is alleged that Shim discloses that operating speeds of the loading robot, the sorting robot, and the unloading robot are determined based on a speed of testing the device. However, there is no indication in the Office Action of where in the applied reference of Shim such a feature is disclosed."*

In response to the above, the apparatus claims must be structurally distinguishable from the prior art. MPEP 2114 states that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). Furthermore, the manner of operating the devices does not differentiate apparatus claim from the prior art. MPEP 2114 states a claim containing a

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“recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Therefore, the examiner believes the prior art still reads on the claimed invention.

f) In regards to claim 34, the applicants lastly argue: *“Similarly, it is alleged that Shim discloses a robot that receives control signals to carry a device of a calculated speed, the calculated speed corresponding based on a time of test execution. In this rejection, the Office Action fails to provide any evidence of where Shim discloses such a feature. In fact, there is no disclose or suggestion in Shim of the robots 90-92 receiving such a control signal or the speeds involved in the operations of the robots.”*

In response to the above, the apparatus claims must be structurally distinguishable from the prior art. MPEP 2114 states that while features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). Furthermore, the manner of operating the devices does not differentiate apparatus claim from the prior art. MPEP 2114 states a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Therefore, the examiner believes the prior art still reads on the claimed invention.

Conclusion

5. Claims 40-42 are allowed over the prior art.
6. The following is a statement of reasons for the indication of allowable subject matter: regarding claim 40, the primary reason for the allowance of the claim, is due to a method for controlling a robot speed of a semiconductor device test apparatus, comprising the steps of: calculating a desired speed value of the robot corresponding to the test time detected; and informing the corresponding robot of the calculated speed value to control the speed of the robot.

Election/Restrictions

7. This application contains claims 11-32 and 38-39 drawn to an invention nonelected with traverse in the reply filed on January 24, 2006. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Base on the arguments and rejections above, the following is being applied.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jermele M. Hollington whose telephone number is (571) 272-1960. The examiner can normally be reached on M-F (9:00-4:00 EST) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ha Nguyen can be reached on (571) 272-1678. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jermele M. Hollington/
Primary Examiner
Art Unit 2829

/J. M. H./
October 10, 2008